

Project No. 240677

**QUARTERLY PROGRESS REPORT
POWERINE REFINERY
SANTA FE SPRINGS, CALIFORNIA**

PREPARED FOR

**POWERINE OIL COMPANY
12354 LAKELAND ROAD
SANTA FE SPRINGS, CALIFORNIA 90670**

PREPARED BY

**IT Corporation
17461 Derian Avenue
Irvine, California 92714**

October 1987

TABLE OF CONTENTS

	<u>PAGE</u>
1.0 INTRODUCTION	1
1.1 PURPOSE AND SCOPE OF WORK	1
2.0 FIELD INVESTIGATION	1
2.1 GROUND-WATER MONITORING AND SAMPLING	1
3.0 LABORATORY TESTING	4
4.0 GROUND-WATER QUALITY	7
5.0 SUMMARY AND CONCLUSIONS	12
APPENDIX A - LABORATORY REPORTS	
APPENDIX B - CHAIN-OF-CUSTODY RECORDS	

LIST OF TABLES

<u>TABLE NO.</u>	<u>TITLE</u>
1	Water-Level Elevation
2	Sample Numbers, Times, and Methods
3	Ground-Water Quality Data

LIST OF FIGURES

<u>FIGURE NO.</u>	<u>TITLE</u>
1	Site Vicinity Map
2	Ground-Water Contours for Upper Aquifer

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE OF WORK

This report summarizes the results of IT Corporation's quarterly ground-water monitoring and sampling, conducted in September 1987, at Powerine Refinery (site), located at 12354 Lakeland Road, Santa Fe Springs, California (Figure 1). Activities included ground-water monitoring, sampling, and laboratory analyses.

2.0 FIELD INVESTIGATION

2.1 GROUND-WATER MONITORING AND SAMPLING

The field investigation consisted of monitoring and sampling fifteen on-site ground-water monitoring wells between September 24 and 30, 1987. The depth to ground water was measured and the presence of free product in the monitoring wells was checked. Only thirteeen ground-water wells (MW-101, MW-103, MW-104, MW-201, MW-203 through MW-206, MW-501 through MW-504 and PW-6) could be sampled this quarter. Well MW-202 was not sampled due to the insufficient volume of water in the well. Well MW-102 could not be sampled because it was found to have been destroyed at the time of the July 1987 monitoring, apparently due to heavy traffic in the area.

In order to minimize the risk of cross-contamination during the monitoring and sampling program, work proceeded in order from wells with the least reported contamination to wells with increasingly contaminated water. In addition, before monitoring and sampling each well, all equipment used within the well (including pump, tape measures, bailers, etc.) was washed in a trisodium phosphate (TSP) solution, thoroughly rinsed with tap water, and then rinsed with distilled water.

Prior to sampling each monitoring well, the depth to ground water was measured (Table 1). A steel tape and chain (with water-indicator paste applied to one side of the tape and a gasoline-indicator paste to the other side) was used to

DRAWN BY
 MPS
 11-1-85
 CHECKED BY
 7-17-85
 APPROVED BY
 7-14-85
 DRAWING NUMBER
 850009-A1

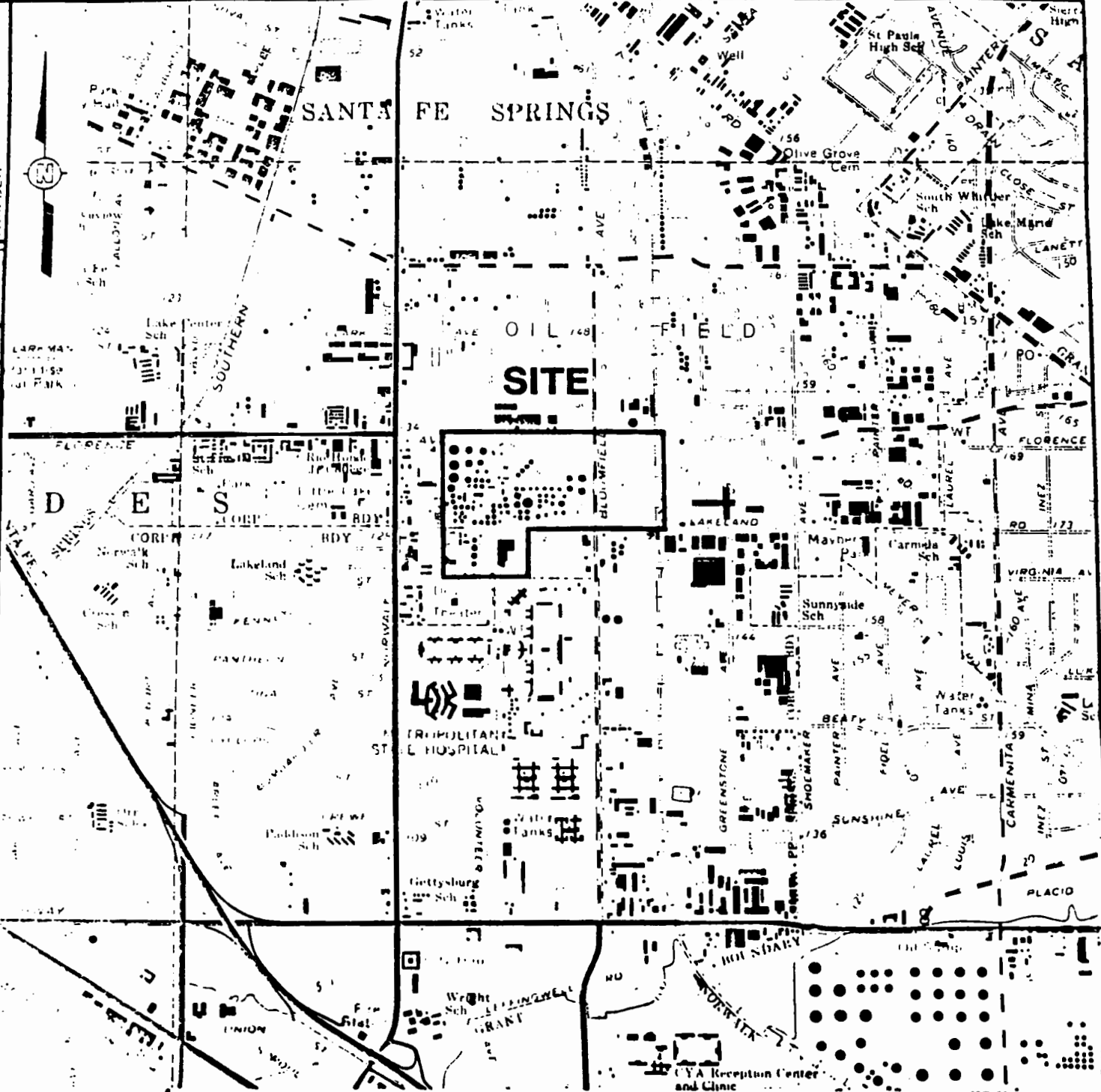


FIGURE 1

SITE VICINITY MAP

PREPARED FOR

POWERINE OIL COMPANY
 SANTA FE SPRINGS, CALIFORNIA

REFERENCE:
 7.5 MINUTE USGS TOPOGRAPHIC MAP OF
 WHITTIER, CALIFORNIA, QUADRANGLE
 DATE: 1965, PHOTO REVISED 1981
 SCALE: 1" = 2000'



... Creating a Safer Tomorrow

TABLE 1
WATER LEVEL ELEVATION

Monitoring Well No.	Date	Elevation Top of Casing (feet, msl)	Depth to Water (feet)	Water Level Elevations (feet, msl)	Free Product (feet)
MW-101	9/28/87	134.98	87.61	47.37	ND
MW-102	9/28/87	134.81	a	a	a
MW-103	9/30/87	136.95	91.62	45.33	ND
MW-104	9/28/87	141.60	87.31	54.29	ND
MW-201	9/30/87	132.91	89.08	43.83	ND
MW-202	9/30/87	137.89	a	a	ND
MW-203	9/28/87	143.89	94.78	49.11	ND
MW-204	9/30/87	140.14	93.35	46.79	ND
MW-205	9/28/87	138.17	88.66	49.51	ND
MW-206	9/30/87	129.93	91.80	38.13	ND
MW-501	9/30/87	128.70	90.56	38.14	ND
MW-502	9/30/87	131.19	93.11	38.32	ND
MW-503	9/30/87	131.43	91.64	39.79	ND
MW-504	9/30/87	133.83	89.84	44.43	0.51

ND - Not detected
TR - Trace
a - Not measured

measure the depth to water and to detect floating free product. Free product was detected only in MW-504 (Table 1). Figure 2 shows the water-table elevation contours based on water-level measurements collected from September 24 to 30, 1987. Water table elevations in all of the wells are included in Table 1. The ground-water flow direction is toward the south-southwest, with no major apparent change from the previous monitorings.

Before sampling the ground water, each monitoring well was purged by pumping at least 3 well volumes or until constant readings of pH, electrical conductivity and temperature in discharged waters were recorded. Two methods were utilized to purge the wells - hand bailing and pumping with a Fultz® ground-water sampling pump (Table 2). Purged water was contained in 55-gallon drums to be disposed of by refinery personnel at a later date. All water samples were collected by using a Teflon® bailer except MW-504 and PW-6. A one-gallon PVC bailer was used in MW-504 because of the presence of free product in the well. PW-6, a deep on-site production well equipped with a pump, was sampled directly from the faucet located at the pump.

3.0 LABORATORY TESTING

Two ground-water samples were collected from each of the wells and analyzed for volatile hydrocarbons (EPA Method 624). The samples were stored in 40-ml vials with no air space. All samples were placed in pre-cleaned bottles obtained from the IT Laboratory in Cerritos, California, and were stored on ice before delivery to the laboratory. Samples were entered on the IT Chain-of-Custody forms (Appendix B) to ensure sample integrity and were then delivered to the IT Laboratory for chemical analyses.

For the purpose of quality control, two control blank samples (MW-601 and MW-604), consisting of distilled water collected through the pre-cleaned Teflon® bailer, used for sampling, also were submitted for analyses.

FX-9 Wells

TABLE 2
SAMPLE NUMBERS, TIMES, AND METHODS

SAMPLE NO.	DATE	TIME	PURGING METHOD	SAMPLING METHOD
MW-101	9/28/87	14:25	1-gal PVC bailer	Teflon bailer
MW-102	Not sampled, the well is destroyed			
MW-103	9/30/87	11:25	Fultz pump	Teflon bailer
MW-104	9/28/87	10:15	Fultz pump	Teflon bailer
MW-201	9/30/87	12:25	Fultz pump	Telfon bailer
MW-202	Not sampled due to insufficient volume of water in well			
MW-203	9/28/87	11:30	Fultz pump	Teflon bailer
MW-204	9/30/87	10:30	Fultz pump	Teflon bailer
MW-205	9/28/87	12:55	Fultz pump	Teflon bailer
MW-206	9/30/87	15:22	Fultz pump	Teflon bailer
MW-501	9/30/87	16:01	Fultz pump	Teflon bailer
MW-502	9/30/87	13:45	Fultz pump	Teflon bailer
MW-503	9/30/87	15:45	1-gal PVC bailer	1-gal PVC bailer
MW-504	9/30/87	16:10	Production pump	direct
MW-601-blank	9/30/87	10:40	Control blank*	
MW-604-blank	9/30/87	15:30	Control blank*	

*Control blank - Distilled water sampled with a precleaned Teflon bailer.

4.0 GROUND WATER QUALITY

Complete analytical results of the ground-water samples are presented in the Certificates of Analysis, Appendix A. Review of the certificates of analysis reveal that only four compounds, including benzene, ethylbenzene, toluene, and xylene (BETX) were detected in most of the samples. Therefore, BETX concentrations were summarized in Table 3. Some halogenated hydrocarbons were also found in very low concentrations, ranging from trace to 16 $\mu\text{g}/\text{l}$, in some of the samples. In addition, some samples showed concentrations of some non-priority pollutant volatile hydrocarbons (Appendix A). Sample MW-101 showed acetone concentrations of 1400 $\mu\text{g}/\text{l}$. The presence of acetone in MW-101 can not be explained at this time. Future monitoring results are needed to investigate the source of acetone in this well. Acetone was below detection limit in all other samples.

For the purpose of this report, benzene has been chosen as the indicator parameter to characterize water quality at the site. Benzene was chosen because fluctuations in the concentrations of ethylbenzene, toluene, and xylene appear to follow a similar trend. Benzene concentrations range from non-detectable <5 $\mu\text{g}/\text{l}$, to a maximum of 12,000 $\mu\text{g}/\text{l}$. Non-detectable concentrations were reported from two upgradient wells, MW-104 and MW-205, and from PW-6. PW-6 is a downgradient production well screened in the lower aquifer (Figure 2).

The highest benzene concentrations, reported as 4,100 $\mu\text{g}/\text{l}$, 8,400 $\mu\text{g}/\text{l}$, and 12,000 $\mu\text{g}/\text{l}$, were observed in MW-206, MW-502, and MW-504, respectively. The reported high concentrations of benzene in MW-504 were expected because 0.51 feet of free product were measured in the well at the time of monitoring.

Slight increases, compared with June 1987 data, in benzene concentrations were found in MW-101, MW-103, MW-203, and MW-206. Slight decreases in benzene concentrations were found in MW-201, MW-204, MW-501, MW-502, and MW-503. Although these increases and decreases are noted, the findings are generally

TABLE 3
GROUND WATER QUALITY DATA
(ALL CONCENTRATIONS ARE IN $\mu\text{g/l}$)

WELL NO.	DATE	BENZENE	ETHYLBENZENE	TOLUENE	TOTAL XYLENES
MW-101	OCT 1985	TR35	<5	<5	<5
	JUL 1986	58	TR5	<1	<1
	NOV 1986	62	3.3	1.4	1.5
	JAN/FEB 1987	39	2.5	TR<1.0	TR<1.0
	JUNE 1987	43	1.6	0.5	2.6
	SEPT 1987	340	37	ND<30	ND<30
MW-102	OCT 1985	8400	1200	2400	7300
	JUL 1986	3,300	790	<50	3200
	NOV 1986	a	a	a	a
	JAN/FEB 1987	a	a	a	a
	JUNE 1987	b	b	b	b
	SEPT 1987	b	b	b	b
MW-103	OCT 1985	TR190	<25	TR12	<25
	JUL 1986	TR4	<1	<1	<1
	NOV 1986	78	ND<1.0	2.2	5.7
	JAN/FEB 1987	180	1.0	1.0	3.9
	JUNE 1987	69	1.3	1.1	3.5
	SEPT 1987	120	ND<5	ND<5	ND<5
MW-104	OCT 1985	<1	<1	<1	<1
	JUL 1986	<1	<1	<1	<1
	NOV 1986	<1	<1	<1	<1
	JAN/FEB 1987	ND<1	ND<1	ND<1	ND<1
	JUNE 1987	0.6	ND<0.5	0.5	1.5
	SEPT 1987	ND<5	ND<5	ND<5	ND<5
MW-201	OCT 1985	1600	140	650	260
	JUL 1986	<1	<1	<1	<1
	NOV 1986	68	10	10	32
	JAN/FEB 1987	70	5.0	4.0	15
	JUNE 1987	290	23	12	39
	SEPT 1987	120	9	12	12

a - Not sampled due to presence of free product.

b - Not sampled, well is destroyed.

ND - This compound was not detected; the limit of detection for this analysis is the amount stated in the table above.

TR - Trace, this compound was present, but was below the level at which concentration could be determined.

TABLE 3
(continued)

GROUND WATER QUALITY DATA
(ALL CONCENTRATIONS ARE IN $\mu\text{g/l}$)

WELL NO.	DATE	BENZENE	ETHYLBENZENE	TOLUENE	TOTAL XYLENES
MW-202	OCT 1985	1600	280	1500	2200
	JUL 1986	8100	73	7700	6300
	NOV 1986	b	b	b	b
	JAN/FEB 1987	b	b	b	b
	JUNE 1987	b	b	b	b
	SEPT 1987	b	b	b	b
MW-203	OCT 1985	24	TR2	TR1	TR2
	JUL 1986	50	<1	TR6	18
	NOV 1986	88	TR<1.0	1.4	1.9
	JAN/FEB 1987	78	TR<1.0	1.0	3.4
	JUNE 1987	1.0	1.6	0.7	2.9
	SEPT 1987	92	ND<5	ND<5	ND<5
MW-204	OCT 1985	16	<1	<1	<1
	JUL 1986	TR9	<1	<1	<1
	NOV 1986	260	15	6.7	41
	JAN/FEB 1987	9.2	2.6	TR<1.0	2.3
	JUNE 1987	45	2.8	0.7	3.4
	SEPT 1987	18	ND<5	ND<5	ND<5
MW-205	OCT 1985	43	<1	<1	<1
	JUL 1986	13	<1	<1	<1
	NOV 1986	7.5	ND<1.0	ND1.0	1.5
	JAN/FEB 1987	4.3	TR<1.0	ND<1.0	1.2
	JUNE 1987	3.6	0.5	0.6	1.5
	SEPT 1987	ND<5	ND<5	ND<5	ND<5

a - Not sampled due to presence of free product.

b - Not sampled due to insufficient volume of water in well.

ND - This compound was not detected; the limit of detection for this analysis is the amount stated in the table above.

TR - Trace, this compound was present, but was below the level at which concentration could be determined.

8

TABLE 3
(continued)

GROUND WATER QUALITY DATA
(ALL CONCENTRATIONS ARE IN $\mu\text{g/l}$)

WELL NO.	DATE	BENZENE	ETHYLBENZENE	TOLUENE	TOTAL XYLENES
MW-206	OCT 1985	4600	78	3000	6200
	JUL 1986	3800	TR82	1800	9000
	NOV 1986	6800	1800	2700	7100
	JAN/FEB 1987	4500	1100	1800	3600
	JUNE 1987	3700	1300	1300	3200
	SEPT 1987	4100	1300	930	4000
MW-501	OCT 1985	c	c	c	c
	JUL 1986	1400	290	51	470
	NOV 1986	1500	210	67	140
	JAN/FEB 1987	1500	160	TR<50	74
	JUNE 1987	2200	210	40	78
	SEPT 1987	1400	170	ND<50	ND<50
MW-502	JUL 1986	10,000	1200	4100	6900
	NOV 1986	6200	1500	4100	8500
	JAN/FEB 1987	6300	960	1700	5200
	JUNE 1987	13,000	1400	2100	5600
	SEPT 1987	8400	1300	1700	5500
MW-503	JUL 1986	140	<1	<1	740
	NOV 1986	95	940	290	1600
	JAN/FEB 1987	TR<25	440	95	690
	JUNE 1987	620	330	360	510
	SEPT 1987	53	280	76	390
MW-504	JUL 1986	1700	<20	520	3200
	NOV 1986	a	a	a	a
	JAN/FEB 1987	a	a	a	a
	JUNE 1987	a	a	a	a
	SEPT 1987	12000	4000	16000	24000

a - Not sampled due to presence of free product.

b - Not sampled due to insufficient volume of water in well.

ND - This compound was not detected; the limit of detection for this analysis is the amount stated in the table above.

TR - Trace, this compound was present, but was below the level at which concentration would be determined.

TABLE 3
(Continued)

GROUND WATER QUALITY DATA
(ALL CONCENTRATIONS ARE IN $\mu\text{g/l}$.)

WELL NO.	DATE	BENZENE	ETHYLBENZENE	TOLUENE	TOTAL XYLENES
PW-6	SEPT 1987	ND<5	ND<5	ND<5	ND<5
CONTROLS BLANKS					
MW-601	SEPT 1987	5	ND<5	9	ND<5
MW-604	SEPT 1987	ND<5	ND<5	ND<5	ND<5

- a - Not sampled due to presence of free product.
b - Not sampled due to insufficient volume of water in well.
ND - This compound was not detected; the limit of detection for this analysis is the amount stated in the table above.
TR - Trace, this compound was present, but was below the level at which concentration could be determined.

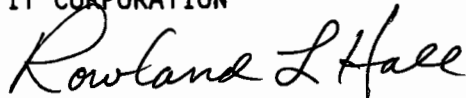
consistent with the previous sampling results as shown in Table 3. The control blank sample MW-601 was reported to contain 5 µg/l benzene and 9 µg/l toluene. Control blank sample MW-604 was reported to be below detection limits for all analyzed compounds.

5.0 SUMMARY AND CONCLUSIONS

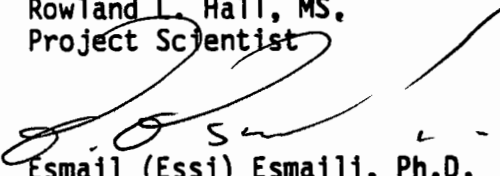
Fifteen ground-water wells at the site were monitored between September 24 and 30, 1987. The ground-water flow direction was towards the south-southwest, with slight decreases in water levels as compared with previous monitorings. Water samples were collected from each of these wells after purging. The samples were then analyzed by the IT laboratory in Cerritos, California for volatile organic compounds using combined gas chromatography-mass spectrometry according to EPA Method 624. The findings of these analyses are consistent with previous quarterly sampling results.

Respectfully submitted,

IT CORPORATION



Rowland L. Hall, MS.
Project Scientist



Esmail (Essi) Esmaili, Ph.D.
Project Manager

RLH/EE:djl

APPENDIX A
LABORATORY REPORTS



ANALYTICAL SERVICES

17606 Fabrica Way • Cerritos, California 90701 • 213-921-9831 / 714-523-9200



CERTIFICATE OF ANALYSIS

Prepared for: IT Corporation
17451 Darian Ave.
Irvine, CA 92714

Date: October 9, 1987

Attn: Essi Essaili/R. Hall

Date Received: September 30, 1987

P.O. Number 240577
Powerine Oil

Job Number 43097/sls

Revised Report

Eleven (11) liquid samples labeled: MH-501-P-S1, MH-206-P-S1, MH-504-P-S1,
MH-502-P-S1, MH-504-P-S1, MH-204-P-S1,
MH-501-P-S1, MH-103-P-S1, MH-201-P-S1,
MH-503-P-S1, PW-6-P-S1

The samples were analyzed for volatile organic contaminants using combined gas chromatography-mass spectrometry according to a modified EPA Method 824, purge and trap. Results for compounds on the EPA Hazardous Substances List (HSL) are given on the enclosed summary sheets. Additional non-HSL volatile organic compounds found are listed below.

Non-HSL Volatiles

<u>Sample</u>	<u>Compound</u>	<u>Micrograms/Liter</u>
MH-206-P-S1	Butene isomers	500
	Cyclopentene	200
	Methylbutane	200
	2-Pentene	100
	Dimethylcyclopropane	500
	Cyclohexane	200
	Methylcyclopentene	200
	Ethylpropenylbenzene isomer	100
	Trimethylbenzene isomer	100
	Unknown hydrocarbon	300
MH-502-P-S1	Cyclohexane	500
	Methylcyclopentene	500

I certify that this report truly represents the finding of work performed by me or under my direct supervision.

Reviewed and Approved

Shararah Nasser-Maddell
Shararah Nasser-Maddell
Group Leader

Richard L. Merrell
Richard L. Merrell
Laboratory Director

INTERNATIONAL TECHNOLOGY CORPORATION

IT Corporation
E. Esmaili/R. Hall

Job #43075
Page 2

Non-HSL Volatiles (Continued)

<u>Sample</u>	<u>Compound</u>	<u>Micrograms/Liter</u>
Mt-504-P-S1	2-Methylbutane	1000
	2-Pentene	800
	Dimethylcyclopropane	800
	Cyclohexane	1000
	Methylethylbenzene isomers	2900
	Unknown hydrocarbons	3000
Mt-503-P-S1	2-Methylpropane	200
	2-Pentene	50
	Pentane	100
	Dimethylcyclopropane	100
	Cyclohexane	200
	Methylcyclopentane	200
	Cyclohexene	50
	Dimethylbutane	50
	Methylcyclopentene	90
	Propenylbenzene isomer	70
	Unknown	300
Mt-201-P-S1	2-Methylpropane	6
	Cyclopentene	7
	Pentane	10
	Dimethylcyclopropane	10
	Cyclohexane	20
	Methylethylcyclopropane isomer	20
	Dimethylbutane	10
	Dimethylcyclopentane isomer	5
	Trimethylcyclopentane isomer	10
	Unknown hydrocarbons	25
	Unknowns	100

INTERNATIONAL TECHNOLOGY CORPORATION

IT Corporation
E. Essajli/R. HallJob #43097
Page 3Non-HSL Volatiles (Continued)

<u>Sample</u>	<u>Compound</u>	<u>Micrograms/Liter</u>
MW-103-P-S1	2-Methylpropane	60
	Butene isomer	30
	Pentane	40
	Pentene	40
	Cyclohexane	200
	Methylcyclopentane	200
	Dimethylbutane	50
	Dimethylcyclopentane	20
	Methylcyclohexane	40
	Dimethylpentane	20
	Tetramethylbutane	40
	Unknown hydrocarbons	150
	Unknowns	240
MW-501-P-S1	Trichlorofluoromethane	60
	Butene isomers	120
	Methylbutane	70
	Dimethylcyclopropane	100
	Cyclohexane	300
	Methylcyclopentane	200
	Propenylbenzene isomer	60
MW-204-P-S1	Pentane	6
	Pentene	7
	Cyclohexane	9
	Methylcyclopentane	20
	Dimethylbutane	10
	Dimethylpentane	5
	Tetramethylpentane	20
	Unknown hydrocarbon	20
	Unknowns	23

**Volatile Organic Compounds
(Micrograms/liter)**

<u>Compound</u>	<u>MW-503-P-S1</u>	<u>MW-206-P-S1</u>	<u>MW-604-P-S1</u>	<u>MW-502-P-S1</u>
Chloromethane	ND<50	ND<300	ND<10	ND<1000
Bromomethane	ND<50	ND<300	ND<10	ND<1000
Vinyl chloride	ND<50	ND<300	ND<10	ND<1000
Chloroethane	ND<50	ND<300	ND<10	ND<1000
Dichloromethane (methylene chloride)	ND<30	ND<100	ND<5	ND<500
Acetone	ND<50	ND<300	ND<10	ND<1000
Carbon disulfide	ND<30	ND<100	ND<5	ND<500
1,1-Dichloroethylene	ND<30	ND<100	ND<5	ND<500
1,1-Dichloroethane	ND<30	ND<100	ND<5	ND<500
trans-1,2-Dichloroethene	TR<30	ND<100	ND<5	ND<500
Chloroform	ND<30	ND<100	ND<5	ND<500
1,2-Dichloroethane	ND<30	ND<100	ND<5	ND<500
Methyl ethyl ketone (2-Butanone)	ND<50	ND<300	ND<10	ND<1000
1,1,1-Trichloroethane	ND<30	ND<100	ND<5	ND<500
Carbon tetrachloride	ND<30	ND<100	ND<5	ND<500
Vinyl acetate	ND<50	ND<300	ND<10	ND<1000
Bromodichloromethane	ND<30	ND<100	ND<5	ND<500
1,2-Dichloropropene	ND<30	ND<100	ND<5	ND<500
trans-1,3-Dichloropropene	ND<30	ND<100	ND<5	ND<500
Trichloroethene	ND<30	ND<100	ND<5	ND<500
Chlorodibromomethane	ND<30	ND<100	ND<5	ND<500

INTERNATIONAL TECHNOLOGY CORPORATION

Volatile Organic Compounds (Continued)
(Micrograms/liter)

<u>Compound</u>	<u>MM-503-P-S1</u>	<u>MM-206-P-S1</u>	<u>MM-604-P-S1</u>	<u>MM-502-P-S1</u>
1,1,2-Trichloroethane	ND<30	ND<100	ND<5	ND<500
Benzene	53	4100	ND<5	8400
cis-1,3-Dichloropropene	ND<30	ND<100	ND<5	ND<500
2-Chloroethyl vinyl ether	ND<50	ND<300	ND<10	ND<1000
Tribromomethane, (Bromoform)	ND<30	ND<100	ND<5	ND<500
2-Hexanone	ND<50	ND<300	ND<10	ND<1000
4-Methyl-2-pentanone	ND<50	ND<300	ND<10	ND<1000
Tetrachloroethene	ND<30	ND<100	ND<5	ND<500
1,1,2,2-Tetrachloroethane	ND<30	ND<100	ND<5	ND<500
Toluene	76	930	ND<5	1700
Chlorobenzene	ND<30	ND<100	ND<5	ND<500
Ethyl benzene	280	1300	ND<5	1300
Styrene	ND<30	ND<100	ND<5	ND<500
Xylene (Total)	390	4000	ND<5	5500
Acrolein	ND<100	ND<500	ND<20	ND<2000
Acrylonitrile	ND<30	ND<100	ND<5	ND<500
Dichlorobenzenes	ND<30	ND<100	ND<5	ND<500

ND - This compound was not detected; the limit of detection for this analysis is the amount stated in the table above.

INTERNATIONAL TECHNOLOGY CORPORATION

Volatile Organic Compounds (Continued)
 (Micrograms/liter)

Compound	MM-504-P-S1	MM-204-P-S1	MM-601-P-S1	MM-103-P-S1
Chloromethane	ND<1000	ND<10	ND<10	ND<10
Bromomethane	ND<1000	ND<10	ND<10	ND<10
Vinyl chloride	ND<1000	ND<10	ND<10	ND<10
Chloroethane	ND<1000	ND<10	ND<10	ND<10
Dichloromethane (methylene chloride)	ND<500	ND<5	ND<5	ND<5
Acetone	ND<1000	ND<10	ND<10	ND<10
Carbon disulfide	ND<500	ND<5	ND<5	ND<5
1,1-Dichloroethylene	ND<500	ND<5	ND<5	ND<5
1,1-Dichloroethane	ND<500	ND<5	ND<5	ND<5
trans-1,2-Dichloroethene	ND<500	ND<5	ND<5	ND<5
Chloroform	ND<500	ND<5	ND<5	ND<5
1,2-Dichloroethane	ND<500	16	ND<5	ND<5
Methyl ethyl ketone (2-Butanone)	ND<1000	ND<10	ND<10	ND<10
1,1,1-Trichloroethane	ND<500	ND<5	ND<5	ND<5
Carbon tetrachloride	ND<500	ND<5	ND<5	ND<5
Vinyl acetate	ND<1000	ND<10	ND<10	ND<10
Bromodichloromethane	ND<500	ND<5	ND<5	ND<5
1,2-Dichloropropane	ND<500	ND<5	ND<5	ND<5
trans-1,3-Dichloropropene	ND<500	ND<5	ND<5	ND<5
Trichloroethene	ND<500	ND<5	ND<5	ND<5
Chlorodibromomethane	ND<500	ND<5	ND<5	ND<5

INTERNATIONAL TECHNOLOGY CORPORATION

Volatile Organic Compounds (Continued)
(Micrograms/liter)

Compound	MM-504-P-S1	MM-204-P-S1	MM-601-P-S1	MM-103-P-S1
1,1,2-Trichloroethane	ND<600	ND<5	ND<5	ND<5
Benzene	12000	18	5	120
cis-1,3-Dichloropropene	ND<500	ND<5	ND<5	ND<5
2-Chloroethyl vinyl ether	ND<1000	ND<10	ND<10	ND<10
Tribromomethane, (Bromoform)	ND<500	ND<5	ND<5	ND<5
2-Hexanone	ND<1000	ND<10	ND<10	ND<10
4-Methyl-2-pentanone	ND<1000	ND<10	ND<10	ND<10
Tetrachloroethene	ND<500	ND<5	ND<5	ND<5
1,1,2,2-Tetrachloroethane	ND<500	ND<5	ND<5	ND<5
Toluene	15000	ND<5	9	ND<5
Chlorobenzene	ND<500	ND<5	ND<5	ND<5
Ethyl benzene	4000	ND<5	ND<5	ND<5
Styrene	ND<500	ND<5	ND<5	ND<5
Xylene (Total)	24000	ND<5	ND<5	ND<5
Acrolein	ND<2000	ND<20	ND<20	ND<20
Acrylonitrile	ND<500	ND<5	ND<5	ND<5
Dichlorobenzenes	ND<500	ND<5	ND<5	ND<5

ND - This compound was not detected; the limit of detection for this analysis is the amount stated in the table above.

INTERNATIONAL TECHNOLOGY CORPORATION

Volatile Organic Compounds (Continued)
(Micrograms/liter)

<u>Compound</u>	<u>MI-201-P-S1</u>	<u>MI-501-P-S1</u>	<u>PM-6-P-S1</u>
Chloromethane	ND<10	ND<100	ND<10
Bromomethane	ND<10	ND<100	ND<10
Vinyl chloride	ND<10	ND<100	ND<10
Chloroethane	ND<10	ND<100	ND<10
Dichloromethane (methylene chloride)	ND<5	ND<50	ND<5
Acetone	ND<10	ND<100	ND<10
Carbon disulfide	ND<5	ND<50	ND<5
1,1-Dichloroethylene	ND<5	ND<50	ND<5
1,1-Dichloroethane	ND<5	ND<50	ND<5
trans-1,2-Dichloroethene	7	TR<50	ND<5
Chloroform	ND<5	ND<50	ND<5
1,2-Dichloroethane	3	ND<50	ND<5
Methyl ethyl ketone (2-Butanone)	ND<10	ND<100	ND<10
1,1,1-Trichloroethane	ND<5	ND<50	ND<5
Carbon tetrachloride	ND<5	ND<50	ND<5
Vinyl acetate	ND<10	ND<100	ND<10
Bromodichloromethane	ND<5	ND<50	ND<5
1,2-Dichloropropane	ND<5	ND<50	ND<5
trans-1,3-Dichloropropene	ND<5	ND<50	ND<5
Trichloroethene	ND<5	ND<50	ND<5
Chlorodibromomethane	ND<5	ND<50	ND<5

INTERNATIONAL TECHNOLOGY CORPORATION

Volatile Organic Compounds (Continued)
(Micrograms/liter)

Compound	MA-201-P-S1	MA-501-P-S1	PA-8-P-S1
1,1,2-Trichloroethane	ND<5	ND<50	ND<5
Benzene	120	1400	ND<5
cis-1,3-Dichloropropene	ND<5	ND<50	ND<5
2-Chloroethyl vinyl ether	ND<10	ND<100	ND<10
Tribromomethane, (Bromoform)	ND<5	ND<50	ND<5
2-Hexanone	ND<10	ND<100	ND<10
4-Methyl-2-pentanone	ND<10	ND<100	ND<10
Tetrachloroethene	ND<5	ND<50	ND<5
1,1,2,2-Tetrachloroethane	ND<5	ND<50	ND<5
Toluene	12	ND<50	ND<5
Chlorobenzene	ND<5	ND<50	ND<5
Ethyl benzene	9	170	ND<5
Styrene	ND<5	ND<50	ND<5
Xylene (Total)	12	ND<50	ND<5
Acrolein	ND<20	ND<200	ND<20
Acrylonitrile	ND<5	ND<50	ND<5
Dichlorobenzenes	ND<5	ND<50	ND<5

ND - This compound was not detected; the limit of detection for this analysis is the amount stated in the table above.

SENT BY: IT-CERRITOS

; 10- 9-87 3:05PM ;

7146708444

7144748309; # 2

**ANALYTICAL
SERVICES**

17605 Fabrica Way • Cerritos, California 90701 • 213-921-9831 / 714-523-9200

CERTIFICATE OF ANALYSISPrepared for: IT Corporation
17461 Darian Ave.
Irvine, CA 92714

Date: October 9, 1987

Attn: Essi Esmaili/R. Hall

Date Received: September 29, 1987

P.O. Number 240677
Powerine Oil

Job Number 43075/sls

Four (4) liquid samples labeled: MW-104-P-S1, MW-203-P-S2, MW-205-P-S3
and MW-101-P-S4

The samples were analyzed for volatile organic contaminants using combined gas chromatography-mass spectrometry according to a modified EPA Method 624, purge and trap. Results for compounds on the EPA Hazardous Substances List (HSL) are given on the enclosed summary sheets. Additional non-HSL volatile organic compounds found are listed below.

Non-HSL Volatiles

<u>Sample</u>	<u>Compound</u>	<u>Micrograms/Liter</u>
MW-205-P-S3	Dimethylbutane	10
	Unknowns	20
MW-203-P-S3	Fluoropropane	7
	2-Methylpropane	10
	Butene isomers	50
	Pentene isomer	7
	Cyclohexane	20
	Methylcyclopentane	10
	Dimethylbutane	20
	Trimethylhexane	8
	Trimethylcyclopentanes	28
	Unknown aliphatic hydrocarbons	45
	Unknown	50

I certify that this report truly represents the finding of
work performed by me or under my direct supervision.

Sharareh N. Moaddeli
Sharareh Nasser-Moaddeli
Group Leader

Reviewed and Approved

Richard L. Merrell
Richard L. Merrell
Laboratory Director

INTERNATIONAL TECHNOLOGY CORPORATION

IT Corporation
E. Esmaili/R. Hall

Job #43078
Page 2

Non-HSL Volatiles (Continued)

<u>Sample</u>	<u>Compound</u>	<u>Micrograms/Liter</u>
MW-101-P-S4	Methylpropane	100
	Cyclopentane	800
	Methylbutane	500
	Methylbutene	100
	Pentene	100
	Dimethylcyclopropane	500
	Cyclohexane	100
	Methylcyclopentane	300
	Cyclohexene	100
	Methylcyclopentene	60
	Hexene	40
	Methylpentane	60
	Methylcyclohexene	100
	Dimethylcyclohexene	30
	Unknown aliphatic hydrocarbons	1200
	Unknowns	50

Volatile Organic Compounds
(Micrograms/liter)

<u>Compound</u>	<u>MW-104-P-S1</u>	<u>MW-203-P-S2</u>	<u>MW-205-P-S3</u>	<u>MW-101-P-S4</u>
Chloromethane	ND<10	ND<10	ND<10	ND<50
Bromomethane	ND<10	ND<10	ND<10	ND<50
Vinyl chloride	ND<10	ND<10	ND<10	ND<50
Chloroethane	ND<10	ND<10	ND<10	ND<50
Dichloromethane (ethylene chloride)	ND<5	ND<5	ND<5	ND<30
Acetone	ND<10	ND<10	ND<10	1400
Carbon disulfide	ND<5	ND<5	ND<5	ND<30
1,1-Dichloroethylene	ND<5	ND<5	TR<5	ND<30
1,1-Dichloroethane	ND<5	ND<5	ND<5	ND<30
trans-1,2-Dichloroethane	ND<5	11	ND<5	ND<30
Chloroform	ND<5	ND<5	ND<5	ND<30
1,2-Dichloroethane	ND<5	ND<5	7	ND<30
Methyl ethyl ketone (2-Butanone)	ND<10	ND<10	ND<10	ND<50
1,1,1-Trichloroethane	ND<5	ND<5	ND<5	ND<30
Carbon tetrachloride	ND<5	ND<5	ND<5	ND<30
Vinyl acetate	ND<10	ND<10	ND<10	ND<30
Bromodichloromethane	ND<5	ND<5	ND<5	ND<30
1,2-Dichloropropane	ND<5	ND<5	ND<5	ND<30
trans-1,3-Dichloropropene	ND<5	ND<5	ND<5	ND<30
Trichloroethene	ND<5	ND<5	ND<5	ND<30
Chlorodibromomethane	ND<5	ND<5	ND<5	ND<30

Volatile Organic Compounds (Continued)
(Micrograms/liter)

<u>Compound</u>	<u>MW-104-P-S1</u>	<u>MW-203-P-S2</u>	<u>MW-205-P-S3</u>	<u>MW-101-P-S4</u>
1,1,2-Trichloroethane	ND<5	ND<5	ND<5	ND<30
Benzene	ND<5	92	ND<5	340
cis-1,3-Dichloropropene	ND<5	ND<5	ND<5	ND<30
2-Chloroethyl vinyl ether	ND<10	ND<10	ND<10	ND<50
Tribromomethane, (Bromoform)	ND<5	ND<5	ND<5	ND<30
2-Hexanone	ND<10	ND<10	ND<10	ND<50
4-Methyl-2-pentanone	ND<10	ND<10	ND<10	ND<50
Tetrachloroethene	ND<5	ND<5	ND<5	ND<30
1,1,2,2-Tetrachloroethane	ND<5	ND<5	ND<5	ND<30
Toluene	ND<5	ND<5	ND<5	ND<30
Chlorobenzene	ND<5	ND<5	ND<5	ND<30
Ethyl benzene	ND<5	ND<5	ND<5	37
Styrene	ND<5	ND<5	ND<5	ND<30
Xylene (Total)	ND<5	ND<5	ND<5	ND<30
Acrolein	ND<20	ND<20	ND<20	ND<30
Acrylonitrile	ND<5	ND<5	ND<5	ND<100
Dichlorobenzenes	ND<5	ND<5	ND<5	ND<30

ND - This compound was not detected; the limit of detection for this analysis is the amount stated in the table above.

APPENDIX B
CHAIN-OF-CUSTODY RECORDS



INTERNATIONAL
TECHNOLOGY
CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 121-36

C/C Control No. 10303

PROJECT NAME/NUMBER

Powerine/240677

LAB DESTINATION

IT Cerritos

SAMPLE TEAM MEMBERS

Rory Hall

CARRIER/WAYBILL NO. _____

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-204-PS1	MW-204 Powerine	9/30/87 10:30	GW	40ml		
"	"	"	"	"		
MW-601-PS1	MW-601	10:55	"	"		
"	"	"	"	"		
MW-103-PS1	MW-103	11:25	"	"		
"	"	"	"	"		
MW-201-PS1	MW-201	12:25	"	"		
"	"	"	"	"		
MW-503-PS1	MW-503	13:45	"	"		
"	"	"	"	"		

Special Instructions: _____

Possible Sample Hazards: _____

None Known

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: _____

Rory Hall

Received By: _____

Nguyen 9/30/87 (21815)

2. Relinquished By: _____

Received By: _____

3. Relinquished By: _____

Received by: _____

4. Relinquished By: _____

Received By: _____



INTERNATIONAL
TECHNOLOGY
CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. _____

C/C Control No. _____

PROJECT NAME 17461

PROJECT NUMBER 24401

PROJECT MANAGER F-51, Emilio

BILL TO IT Irvine

PURCHASE ORDER NO. _____

DATE SAMPLES SHIPPED _____

LAB DESTINATION _____

LABORATORY CONTACT _____

SEND LAB REPORT TO _____

DATE REPORT REQUIRED _____

PROJECT CONTACT _____

PROJECT CONTACT PHONE NO. _____

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
10-1 MW-204-P-51	GL	40ml	Loc	EPA 821	
"					
11-1 MW-601-P-51					
"					
11-2 MW-103-P-51					
"					
11-25 MW-201-P-51					
"					
15-45 MW-603-P-51					
"					

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager)

Normal ☒

Rush ☐

(Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ☒

Flammable ☐

Skin Irritant ☐

Highly Toxic ☐

Other ☐

(Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ☐

Disposal by Lab ☒

FOR LAB USE ONLY

Received By _____

Date/Time _____

WHITE - Original, to accompany samples

YELLOW - Field copy

R/A Control No. 024037

C/C Control No. 44-38861-1000

PROJECT NAME/NUMBER Powerline/290611

LAB DESTINATION 11 Carrizos

SAMPLE TEAM MEMBERS R. Hall

CARRIER/WAYBILL NO.

[illegible]

COPY

Special Instructions:

Possible Sample Hazards:

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By:

Received By:

2. Relinquished By:

Received By:

3. Relinquished By:

Received by:

4. Relinquished By:

Received By:



INTERNATIONAL
TECHNOLOGY
CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. _____

C/C Control No. _____

PROJECT NAME _____

PROJECT NUMBER _____

PROJECT MANAGER _____

BILL TO _____

PURCHASE ORDER NO. _____

DATE SAMPLES SHIPPED _____

LAB DESTINATION _____

LABORATORY CONTACT _____

SEND LAB REPORT TO _____

DATE REPORT REQUIRED _____

PROJECT CONTACT _____

PROJECT CONTACT PHONE NO. _____

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
102 AW-6-P-51					
102 AW-6-P-51					
FW-6-P-51	6W	40ml	ice	FW-6-P-51	
"	"	"	"	"	

COPY

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager)

Normal ☒

Rush ☐

(Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ☒

Flammable ☐

Skin Irritant ☐

Highly Toxic ☐

Other ☐

(Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal)

Return to Client ☐

Disposal by Lab ☒

FOR LAB USE ONLY

Received By _____

Date/Time _____

WHITE - Original, to accompany samples

YELLOW - Field copy



CHAIN-OF-CUSTODY RECORD

R/A Control No. 021035

C/C Control No. 103-2

PROJECT NAME/NUMBER Powerine/240677

LAB DESTINATION IT Cerritos

SAMPLE TEAM MEMBERS R. Hall

CARRIER/WAYBILL NO. _____

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-501-PSI	MW-501 Powerine	9/30/87 14:30	40ml ^{GW}	40ml		
"	"	"	"	"		
MW-206-PSI	MW-206	15:22	"	"		
"	"	"	"	"		
MW-604-PSI	MW-604	15:30	"	"		
"	"	"	"	"		
MW-502-PSI	MW-502	16:10	"	"		
"	"	"	"	"		
MW-504-PSI	MW-504	17:38	"	"	free prod	
"	"	"	"	"	"	

Special Instructions: _____

Possible Sample Hazards: Free product in # MW-504

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Rowland L Hall

3. Relinquished By: _____

Received By: R. Hall 17C 11/30/87 11:15

Received by: ES

2. Relinquished By: _____

4. Relinquished By: _____

Received By: _____

Received By: _____



INTERNATIONAL
TECHNOLOGY
CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 07

C/C Control No. 17

PROJECT NAME Lowerline
PROJECT NUMBER 240677
PROJECT MANAGER Essi Esmaili
BILL TO IT Irvine
17461 Dorian Ave
Irvine Ca

DATE SAMPLES SHIPPED
LAB DESTINATION
LABORATORY CONTACT
SEND LAB REPORT TO

IT Irvine
IT Irvine
IT Irvine
IT Irvine

PURCHASE ORDER NO.

DATE REPORT REQUIRED
PROJECT CONTACT
PROJECT CONTACT PHONE NO.

See item Dorian
Rory Hall
(714) 261 6441

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
1430 MW-501-P-51	GW	40ml	Ice	EPA 624	
1432 MW-206-P-51					
1530 MW-604-P-51					
1610 MW-502-P-51					
1730 MW-504-P-51					

COPY

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal ☒ Rush ☐ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ☒ Flammable ☐ Skin Irritant ☐ Highly Toxic ☐ Other ☐ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ☐ Disposal by Lab ☒

FOR LAB USE ONLY

Received By [Signature]

Date/Time 12/1/07

WHITE - Original, to accompany samples
YELLOW - Field copy



CHAIN-OF-CUSTODY RECORD

R/A Control No. 127031
C/C Control No. 40390PROJECT NAME/NUMBER Powerine/240677LAB DESTINATION IT PeritosSAMPLE TEAM MEMBERS R. Hall

CARRIER/WAYBILL NO. _____

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-104-P-51	MW-104	9/28/87 10:15	GW	40 ml		
"	"	" "				
MW-203-P-51	MW-203	9/28/87 11:30				
"	"	" "				
MW-205-P-51	MW-205	9/28/87 12:55				
"	"	" "				
MW-201-P-51	MW-201	9/29/87 10:25				
"	"	" "				

Special Instructions: _____

Possible Sample Hazards: None Known

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Rowland L Hall - 9/29/87 900 3. Relinquished By: _____Received By: Walter Crone, IT, 9.29.87 900 Received by: _____2. Relinquished By: Walter Crone, IT, 9.29.87 1007 4. Relinquished By: _____Received By: Patty Snyder - IT - 9/29/87 1007 Received By: _____



REQUEST FOR ANALYSIS

R/A Control No. 01C/C Control No. 40290

PROJECT NAME PONEXINE OIL
PROJECT NUMBER 240677
PROJECT MANAGER Essi Esmaili
BILL TO IT Corp
17461 Derian Ave
Irvine Ca

DATE SAMPLES SHIPPED
LAB DESTINATION
LABORATORY CONTACT
SEND LAB REPORT TO

4/25/89
IT CORP
Ann O'Connor
Essi Esmaili
IT Corp
Irvine Ca

PURCHASE ORDER NO. _____

DATE REPORT REQUIRED _____

PROJECT CONTACT _____

PROJECT CONTACT PHONE NO. _____

K. Hall
261-6441

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
<u>MW-104-P-51</u>	<u>GW</u>	<u>40ml</u>	<u>ICE</u>	<u>EPA 624</u>	
<u>II</u>				<u>back-up sample only</u>	
<u>MW-203-P-52</u>				<u>EPA 624</u>	
<u>II</u>				<u>back-up sample only</u>	
<u>MW-205-P-53</u>				<u>EPA 624</u>	
<u>II</u>				<u>back-up sample only</u>	
<u>MW-101-P-54</u>				<u>EPA 624</u>	
<u>II</u>				<u>back-up sample only</u>	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X

Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard X

Flammable _____

Stimulant _____

Highly Toxic _____

Other _____
(Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____

Disposal by Lab X

FOR LAB USE ONLY

Received By [Signature]Date/Time 4/25/89

WHITE - Original, to accompany samples
YELLOW - Field copy